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Identification, Response, and Referral of Suicidal Youth Following Applied Suicide Intervention Skills Training

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Gatekeeper training is a public health approach to suicide prevention that encourages community members to identify those at risk for suicide, respond appropriately, and refer for clinical services. Despite widespread use, few studies have examined whether training results in behavior change in participants. This study employed a naturalistic pre–post design to follow 434 participants in Applied Suicide Intervention Skills Training, finding small but significant increases in self-reported identification of at-risk youth, some helpful responses to youth, and numbers of youth referred to treatment from pre-test to 6- to 9-month follow-up. Changes in active listening and helping behaviors meant to support treatment referrals (such as convincing a youth to seek treatment) were not observed over time. Additional analyses explored predictors of self-reported skill utilization including identification as a "natural helper" and attitudes about suicide prevention.

As one of the leading causes of death worldwide, suicide is a major, yet preventable, public health problem (Centers for Disease Control and Prevention [CDC], 2012). Moreover, among youth between the ages of 10 and 24, suicide is the second leading cause of death (CDC, 2014). Youth Risk Behavior Survey data indicate that 17% of high school students in the United States reported seriously considering suicide, 13.6% reported having made a plan for how they would attempt suicide, and 8% reported having made at least one suicide attempt in the last year (CDC, 2013). The sheer magnitude of suicide-related deaths and injuries in the United States supports the need for comprehensive prevention initiatives.

Public health approaches to suicide prevention work to reduce risk factors and promote large-scale, health-education approaches to prevention, such as gatekeeper training. Gatekeeper training programs are hypothesized to reduce suicidal behavior by developing a cadre of individuals within a

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community who are prepared to recognize risk factors and assist high-risk individuals to access the resources they need to secure their safety and recovery (Gould & Kramer, 2001). With respect to prevention of youth suicide, gatekeepers might include pediatricians, juvenile justice staff, teachers, school administrators, coaches, clergy, law enforcement, or even peers. Youth who are at high-risk for suicide often will not refer themselves for medical or mental health care (Wu, Katic, Liu, Fan, & Fuller, 2010), so gatekeeper training is designed to educate community members to identify, respond effectively, and refer youth to appropriate treatment services (Gould & Kramer, 2001; Swank & Buila, 2010).

Multiple studies (Chagnon et al., 2007; Isaac et al., 2009; Keller et al., 2009; Matthieu, Cross, Batres, Flora, & Knox, 2008; Wyman et al., 2008) have demonstrated that participation in gatekeeper training programs increases knowledge, promotes attitudes supportive of suicide prevention, and increases participants' confidence in their ability to intervene with a high-risk individual, with benefits lasting up to 6 months (Chagnon et al., 2007). Health behavior theories (Hayden, 2009; Hochbaum, 1958) suggest that knowledge, attitudes, and self-efficacy are necessary precursors to behavior change; the behaviors that are specifically targeted in gatekeeper training include identifying at-risk youth, responding in a helpful fashion, and referring a high-risk individual to treatment. Unfortunately, few studies have followed gatekeeper training participants to demonstrate whether training actually results in these targeted behavior changes.

A review of gatekeeper training programs designated as "best practices" or "evidence based" by the Suicide Prevention Resource Center (2014) and American Foundation for Suicide Prevention highlights the range of different gatekeeper training programs available. For example, Question, Persuade, Refer (QPR; Quinnett, 1995) is a 90-minute intervention, safeTALK (Tanney, Ramsay, Lang, & Kinzel, 2006) is a half-day training, and Applied Suicide Intervention Skills Training (ASIST; (Rodgers, 2010) is a 2-day (16 hour) training. Due in large part to the Garrett Lee Smith federal appropriation of youth suicide prevention funds, as of 2010, nearly 50,000 professionals had received gatekeeper training in the United States (Rodi, 2010). It stands to reason that agencies sponsoring these trainings would benefit from information about which individuals are most likely to utilize the trainings and, by extension, which individuals might be the best investment for an agency to train in a more costly and time intensive program versus a brief lower cost training.

Several studies have attempted to identify baseline characteristics that predict skill utilization of gatekeeper trainings, but findings have been inconclusive. Cross , Matthieu, Lezine, and Knox (2010) examined many factors including demographics, prior experience with gatekeeper training, prior exposure to suicide, education level, and personality factors to identify predictors of university employees' gatekeeper behaviors following QPR training. None of these variables predicted observable change in gatekeeper skills following training. In a randomized controlled trial of QPR with public school employees, Wyman and colleagues (2008) found that a teacher's self-reported status as a "natural helper" within his/her school predicted the utilization of training skills in the interval following QPR training. In other words, participation in QPR improved the likelihood of asking a youth about his/her suicidal ideation only among teachers who described themselves (prior to their participation in QPR) as natural helpers, (i.e., the teachers to whom students would *already* go to talk about their thoughts and feelings; Wyman et al., 2008). Teachers who did not self-identify as natural helpers did not improve in their gatekeeper behaviors following training. This study suggests that the "natural helper" variable may be a critical baseline indicator of one's potential to be a strong utilizer of gatekeeper training skills.

The Current Study

A primary goal of the current study was to describe the extent of self-reported behavioral utilization of skills taught in ASIST (version 10; Rodgers, 2010). In addition, the study was designed to identify baseline characteristics of participants that might predict utilization 6 months following the training.

ASIST is a 2-day, 16-hour workshop that includes interactive role-play, exercises to promote connection and understanding of the suicidal individual, and specific techniques, such as eliciting reasons for living and dying and constructing a safety plan (Ramsay, 2004). Funded by The Garrett Lee Smith Memorial Act, data for this project were obtained in the context of meeting a statewide objective to increase the number of trained gatekeepers.

Most published evaluations of gatekeeper training programs have been implemented within a specific population, such as public school employees (Mann et al., 2005). The current study includes a community sample of training participants who represent a variety of occupations, backgrounds, rural/urban regions, and youth-serving institutions. The diversity of participants, along with the use of multiple trainers and psychometrically strong assessment instruments (Wyman et al., 2008) are strengths of the current study.

Hypotheses

We hypothesized that participation in ASIST would result in increases (from baseline to 6–9 months post-training) in participants' ability to (1) identify a youth as at risk, (2) respond in a helpful fashion, and (3) refer that youth to services. In addition, we hypothesized that individuals who (1) viewed themselves as natural helpers and (2) who entered training with attitudes supportive of suicide prevention would be more apt to utilize the skills they had learned.

METHODS

Participants

Data were collected from 434 (85 male = 19.6% and 333 female = 76.7%)[1] participants ranging in age from 18 to 70 (M = 42.95; SD = 12.05) who attended trainings in 21 communities within one large midwestern state from July 2010 through August 2012. Trainings were conducted by 10 different certified ASIST trainers in communities ranging from rural to urban to suburban locations, with one training held on a federally recognized Native American reservation. Respondents were encouraged to select all racial, ethnic, and occupational categories that reflected their background. Of the 434 participants, 15 (3.6%) self-identified as of Hispanic or Latino ethnicity, similar to the state's overall population (U.S. Census Bureau, 2010). Of the participants that identified as such, 75% indicated Mexican, Mexican American, or Chicano heritage, 18.8% Puerto Rican, and 6.3% South American. The majority of participants self-identified as White (n = 331; 76.3%), 44 (10.1%) identified as Black or African American, 9 (2.1%) as American Indian or Alaska Native, and 2 as (0.5%) Asian.[2] Participants represented a range of occupational backgrounds, including K-12 and college educators; substance abuse, primary care, and mental health providers; emergency responders; juvenile justice and child welfare employees; and tribal government/services. Please refer to Table 1 for additional demographic information about participants.

Measures

Participants completed a battery of questionnaires prior to and immediately following the 2-day training, as well as a survey

[1]Sixteen participants (3.7%) failed to identify their gender.

[2]Forty-eight participants (11%) failed to identify their race/ethnicity.

TABLE 1
Participant Demographic Information

	n (%)
Gender	
Male	85 (19.6)
Female	333 (76.7)
Missing	16 (3.7)
Race	
White	331 (76.3)
Black/African American	44 (10.1)
American Indian/Alaskan Native	9 (2.1)
Asian	2 (0.05)
Ethnicity	
Hispanic	12 (3.6)
Non-Hispanic	324 (96.4)
Occupation	
Education (K-12)	112 (33.3)
Substance abuse treatment	45 (13.4)
Juvenile justice/probation	37 (11)
Emergency response	38 (11.3)
Higher education	52 (15.5)
Tribal services/tribal government	6 (1.8)
Child welfare	37 (11.1)
Mental health professional	107 (31.8)
Primary health care	42 (12.5)
Other community settings	94 (27.9)

Note. To reduce respondent burden, demographic information was collected at post-test using a survey administered by the U.S. Department of Health and Human Services (2006) Substance Abuse and Mental Health Services Administration (SAMHSA) as part of the Macro International Cross-Site Evaluation of the Garrett Lee Smith Memorial State/Tribal Youth Suicide Prevention and Early Intervention Program. Sixteen participants (3.7%) failed to identify their gender. Forty-eight participants (11%) failed to identify their race/ethnicity.

of self-reported behavioral utilization of training skills completed via Internet survey 6 to 9 months following training.

Training Exit Survey. To reduce respondent burden, demographic data were obtained using a measure standard to the Cross-Site Evaluation of the Garrett Lee Smith Memorial State/Tribal Youth Suicide Prevention and Early Intervention Program. This measure was used to secure demographics including age, gender, occupation, and race.

Gatekeeper Training Survey. The Gatekeeper Training Survey was adapted from a randomized controlled trial of QPR (Wyman et al., 2008) and includes information about practice patterns (identification, response, and referral) as well as baseline characteristics of gatekeepers (natural helper status and gatekeeper efficacy vs. reluctance attitudes). Because the original study focused on staff in a public school setting, all questions referred to "students;" for this study, the word "student" was replaced with "youth," which was defined as those between the ages of 10 and 24 due to the statute appropriating the funding for the project.

The Gatekeeper Training Practice Issues survey measures gatekeeper behaviors prior to training (assessed at pre-test) and after training (assessed at 6- to 9-month follow-up). The items used to measure the constructs of interest are shown in Table 2. *Identification* was defined as the process by which a gatekeeper recognizes that a youth might be at risk. *Response* (pre-test $\alpha = .94$, follow-up $\alpha = .92$) was defined as gatekeeper behaviors meant to assess and support the youth, including frequency of asking about suicidal thoughts, asking about suicide in response to warning signs (pre-test $\alpha = .92$, follow-up $\alpha = .95$), and helping behaviors (pre-test $\alpha = .81$, follow-up $\alpha = .92$). *Referral* (pre-test $\alpha = .81$, follow-up $\alpha = .86$) was defined as providing information, encouraging help-seeking, and actually taking a youth to a professional. Composite scores were created for the response and referral items using procedures detailed by Wyman and colleagues(2008) and by examining internal consistency of items in this sample (Table 2). Because different metrics were used across response and referral items, z scores were used to calculate alphas and means for Response and Referral composite scores. These overall mean scores were used in analyses examining predictors of utilization.

Baseline gatekeeper characteristics were also assessed with the Gatekeeper Training Survey. The Natural Helper Scale (Ordinal $\alpha = .68$) assesses communication between the gatekeeper and youth. Three statements, "Youth talk to me about their thoughts and feelings," "Youth come to me

TABLE 2
Item-Level Components of Gatekeeper Identification, Response, and Referral Variables

	Pre-Test, *M* (SD)	Follow-Up, *M* (SD)
Identification		
How many times in the last 6 months (*none*, *1–2 times*, *3–5 times*, *6–10 times*, *10+ times*, *N/A*) have you thought a youth's behavior might indicate s/he was considering suicide?	1.04 (1.07)	1.43 (1.51)
Response		
Frequency of Asking about Suicide		
How many times in the last 6 months (*none*, *1–2 times*, *3–5 times*, *6–10 times*, *10+ times*, *N/A*) have you asked a youth whether s/he was considering suicide?	1.23 (1.46)	1.62 (1.66)
Asking about Suicide in Response to Warning Signs		
How often in last 6 months (*never*, *seldom*, *sometimes*, *nearly always*, *always*, *N/A*) have you asked about suicide when…		
The youth says something about ending their life	3.30 (1.79)	3.89 (1.62)
The youth seemed depressed	3.00 (1.47)	3.50 (1.36)
The youth experienced a traumatic event	2.83 (1.50)	3.25 (1.45)
You had a feeling something was wrong	3.13 (1.48)	3.63 (1.40)
Asking Composite *M(SD)*	**3.11 (1.40)**	**3.56 (1.32)**
Helping Behaviors		
For suicidal youth in last 6 months, how often (*never*, *seldom*, *sometimes*, *nearly always*, *always*, *N/A*) have you…		
Asked the youth about suicidal thoughts	3.32 (1.63)	3.59 (1.62)
Spent some time listening to the youth	4.13 (1.29)	3.97 (1.57)
Helping Composite *M(SD)*	**3.73 (1.35)**	**3.78 (1.53)**
Referral		
For suicidal youth in last 6 months, how often (*never*, *seldom*, *sometimes*, *nearly always*, *always*, *N/A*) have you…		
Provided appropriate information	3.53 (1.49)	3.69 (1.65)
Convinced the youth to seek help	3.58 (1.44)	3.57 (1.64)
Taken a youth to a mental health professional	2.39 (1.63)	2.38 (1.68)
Referral Composite *M(SD)*	**3.09 (1.30)**	**3.07 (1.50)**
In the last 6 months, how many young people did you personally refer to a mental health professional because you were concerned they might be suicidal (*none*, *1*, *2*, *3*, *4*, *or more*)	1.00 (1.29)	1.76 (1.97)

for advice and assistance when they are troubled," and "Youth turn to me when they are concerned about another youth," are assessed on a 5-point scale ranging from *Never* to *Always*. Gatekeeper Efficacy ($\alpha = .77$) and Gatekeeper Reluctance ($\alpha = .85$) were assessed on a 7-point scale ranging from 1 = *Strongly Disagree* to 7 = *Strongly Agree*, using procedures detailed in Wyman et al., (2008). Agreeing with statements such as "I feel comfortable discussing suicide issues with youth" and "I can make appropriate referrals for youth contemplating suicide" indicate high perceptions of self-efficacy,

whereas identifying with statements such as "I am too busy to participate in suicide prevention activities" or "A suicide prevention program will give youth unwanted ideas about suicide" correspond to higher rates of gatekeeper reluctance.

Follow-Up Survey. The follow-up survey was based on the Gatekeeper Training Practice Issues survey (Wyman et al., 2008) and assessed self-reported skill utilization 6 to 9 months following ASIST. The questions previously described measuring identification, response, and referral were repeated.

Procedure

All individuals over 18 who registered to attend one of 21 state-funded ASIST trainings over the 3-year study were eligible to participate. Each training was sponsored by a local organization (community mental health agencies, nonprofit prevention groups, suicide prevention coalitions, etc.) who marketed the training opportunity via e-mails, fliers, and social media to their local communities. All research procedures were approved by the institutional review board. Of 439 participants who completed ASIST training, 435 (99.1%) consented to participate in the larger outcome evaluation study. Participants completed a paper and pencil pre-test survey, attended the 2-day training, and then completed a paper and pencil post-test survey. Six to 9 months following the completion of training, participants were contacted via e-mail and provided a link to an online follow-up survey. Participants without e-mail access were contacted by mail. Two-thirds (65.7%) of baseline participants completed the follow-up survey (64.6% at Wave 1; 64.7% at Wave 2; 67.8% at Wave 3) on average 208.77 days from the training (SD = 36.34). Participants from each Wave who completed the follow-up survey were entered into a drawing to win a $50 gift card. Participants who completed a follow-up did not differ significantly in age, gender, or race/ethnicity from participants who did not complete a follow-up.

Plan for Analysis

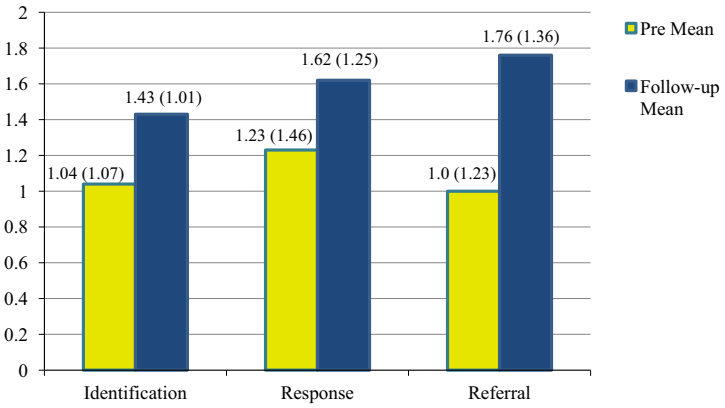
Analyses focused on two primary questions: (1) To what extent did participants increase their identification, response, and referral behaviors across the 6- to 9-month interval from pre-test to follow-up? and (2) Are there baseline characteristics of participants that predict who will go on to report high rates of identification, response, and referral of at-risk youth? Specifically, natural helper designation and attitudes supportive of suicide prevention were expected to predict high self-reported utilization; gatekeeper reluctance attitudes were expected to predict lower levels of self-reported gatekeeper behaviors post-training.

Descriptive statistics were examined to document baseline levels of gatekeeper behaviors. Chi-square tests were used to examine change in gatekeeper behavior from pre-test to follow-up for practice behaviors with ordinal response metrics. When cells became too small to accurately compute the chi-square, they were collapsed. Paired-samples t tests were used to compare pre-test with follow-up data for items/scales with continuous responses. Effect sizes are reported with Cohens d. Linear regressions were used to identify baseline characteristics that predicted self-reported utilization behaviors at follow-up. Regressions assessing response and referral behaviors used a composite (mean of z scored items) as detailed in Table 2. Because we were interested in extent of self-reported gatekeeper behaviors at follow-up as well as measures of change, we examined the direct variables in two ways (overall mean and change from pre-to follow-up).

RESULTS

Extent of Gatekeeper Identification, Response, and Referral Prior to and after Training

The mean levels of three core items reflecting identification, response, and



Note. All categories are significantly different from pre to follow-up, $p < .00$

	Pre- $N = 434$	%	Follow-up $N = 285$	%
Identification is number of times a gatekeeper thought a youth's behavior indicated he/she was considering suicide.				
None	139	32	73	26
1–2	148	34	117	41
3–5	66	15	54	19
6–10	14	3	12	4
10+	20	5	11	4
Missing or N/A	47	11	18	6
Response is frequency of asking youth whether he/she is considering suicide.				
None	176	41	77	27
1–2	63	15	98	34
3–5	53	12	45	16
6–10	25	6	19	7
10+	53	12	27	9
Missing or N/A	64	15	19	7
Referral is number of youth ages 10–24 referred to a mental health professional within a 6 month period.				
None	170	39	109	38
1	69	16	48	17
2	46	11	49	17
3	20	5	17	6
4 or more	28	6	28	16
Missing or N/A	101	23	34	12

Figure 1. Gatekeeper skills pre- and 6-months post Applied Suicide Intervention Skills Training. [Color figure can be viewed at wileyonlinelibrary.com]

referral reported at baseline and follow-up are shown in Figure 1. Tables below the graph provide the distribution of scores on each variable. These items were selected to provide the most interpretable "base rates" of the impact of gatekeeper behaviors. At baseline, gatekeepers reported that they had identified a youth as at risk for suicide an average of once in the 6 months prior to ASIST. At follow-up, gatekeepers reported a slight but significant increase in identification of at-risk youth (see Figure 1 and Table 2 for means); $\chi^2(16, N = 247) = 98.37$, $p = .000$; ES = .36. Interestingly, 139 gatekeepers (32% of participants) reported identifying no youth as at risk at baseline; at follow-up, 73 gatekeepers (17% of follow-up participants) reported identifying no youth. Similarly, the percentage of the sample that identified 1–2 youth increased from pre-test (34%) to follow-up (41%), suggesting that awareness of risk factors may have increased among gatekeepers, facilitating more identification of at-risk youth.

Response to at-risk youth was assessed using a variety of items, including frequency of asking youth about suicide risk, asking about suicide in response to

warning signs, and using helping behaviors. Gatekeepers increased their overall frequency of asking youth whether they were considering suicide (see Figure 1 and Table 2 for means); $\chi^2(16, N = 266) = 1064.00$, $p = .000$, ES = .27. A review of the distribution of scores suggests that the percent of the sample who did not ask about suicide decreased following training (from 41% to 27%), and likewise, the percent of the sample that reported asking once or twice increased from 15% to 34% following training. When confronted with warning signs, such as depression, trauma history, or a "feeling that something is wrong," gatekeepers increased their frequency of asking youth about suicide post-training (see Table 2 for means), $t(197) = -4.60$, $p = .000$, ES = .32. Finally, the composite of specific helping behaviors (querying about ideation and active listening) also increased significantly (see Table 2 for item-level means), $t(159) = -2.44$, $p = .02$, ES = .04. Although the overall composite score was significant, it is important to note that participants increased in their asking behaviors but not in their listening behaviors.

Referral behaviors were also assessed with multiple items. Gatekeepers rated the frequency with which they engaged in behaviors that would support a referral (e.g., provided referral information, convinced youth to seek help, took youth to a mental health professional). Overall, these behaviors did not increase substantially from baseline to follow-up (Table 2), with reports at both time points consistent with the anchor point "nearly always" $t(168) = -1.22$, *ns*. When asked to quantify the number of youth the gatekeeper personally referred to mental health services due to suicide concerns over the past 6 months, the number increased from one youth at baseline to 1.76 (SD = 1.97) youth at follow-up (Figure 1 and Table 2), $t(1, 220) = -5.53$, $p = .000$, ES = .46. A review of score distributions (Figure 1) suggests that the percent of the sample referring no youth or only one youth to treatment remained almost unchanged from pre-test to follow-up; however, there were slight increases in the percent of the sample referring two or more youth. There was a non-significant increase in the number of gatekeepers who reported referring at least one youth to mental health services in the past 6 months; $\chi^2(1, N = 305) = 0.067$, *ns*.

Predictors of Utilization

Participants scores on a baseline measure of "natural helper behaviors" were significantly and positively related to identification of youth as at risk: $\beta = .20$, $F(1, 261) = 10.75$, $p = .001$, and helpful responses to youth at follow-up; $\beta = .18$, $F(1, 264) = 8.36$, $p = .004$, but not to referral behaviors. Natural helper designation was unrelated to change in identification behaviors from baseline to follow-up and negatively related to change in response: $\beta = -.15$, $F(1, 245) = 5.98$, $p = .02$, and referral behaviors over time: $\beta = -.21$, $F(1, 234) = 10.77$, $p = .001$.

"Gatekeeper efficacy" beliefs reported at baseline were significantly and positively related to identification of youth at follow-up: $\beta = .38$, $F(1, 260) = 43.3$, $p = .00$, helpful responses: $\beta = .43$, SE = .05, $p = .00$, and referral behaviors: $\beta = .38$, SE = .05 $p = .00$. Gatekeeper efficacy attitudes measured at baseline did not predict changes in gatekeeper identification or referral behaviors over time (although response was marginally significant, $p = .049$). "Gatekeeper reluctance attitudes" reported at baseline were significantly and negatively related to the identification of youth at risk for suicide: $\beta = -.19$, SE = .09, $p = .02$, helpful responses: $\beta = -.18$, SE = .85, $p = .003$, and referrals: $\beta = -.18$, SE = .44, $p = .003$. Gatekeeper reluctance attitudes did not predict changes in identification, response, or referral practices from pre-test to follow-up.

In a final set of regression analyses, our three baseline participant characteristic variables were compared simultaneously to determine which were most powerful in accounting for gatekeeper behaviors post-training. With respect to identification, only

gatekeeper efficacy was predictive of follow-up behavior: $\beta = .33$, $t = 5.35$, $p = .00$. For response, with all three predictors in the model, gatekeeper efficacy ($\beta = .37$, $t = 6.37$, $p = .00$) and reluctance ($\beta = -.22$, $t = -3.82$, $p = .00$) both remained significant predictors of follow-up response behaviors, but the natural helper variable became nonsignificant ($p = .059$). Finally, with respect to referral, gatekeeper attitudes about either their own efficacy ($\beta = .33$, $t = 5.53$, $p = .00$) or reluctance ($\beta = -.20$, $t = -3.31$, $p = .001$) to engage in suicide prevention activities were significantly related to referral behaviors.

DISCUSSION

In this study we analyzed the impact of participation in ASIST on self-reported gatekeeper behaviors using a longitudinal pre–post design. Strengths of the study include (1) a relatively large, community sample of ASIST trainees who are diverse in age, ethnicity, occupation, and role in the community; (2) a focus on behavioral outcomes across a 6- to 9-month period; and (3) the use of a psychometrically sound measure of gatekeeper behavior that has been used previously in the literature with a different gatekeeper training curriculum (Wyman et al., 2008). The study's weaknesses include the lack of a control group, reliance on self-report information, and attrition of participants at follow-up. However, our follow-up participation is quite adequate relative to other community-based naturalistic designs (Reis & Cornell, 2008; Rivet Amico, 2009).

Our findings indicate that mean levels of most self-reported gatekeeper suicide prevention behaviors significantly increased from pre-test to 6- to 9-month follow-up. Although we were not able to utilize a control group due to funding restrictions, these data are promising and suggest that participation in ASIST may increase rates of youth identified as at risk, increase the frequency and likelihood with which gatekeepers respond to risk in a recommended fashion, and increase actual numbers of youth referred to an appropriate care setting. These findings are important because they suggest that the gatekeeper training model may achieve the targeted public health outcomes of altering gatekeeper behaviors and securing treatment services for at-risk youth.

Despite these promising findings, there were several gatekeeper behaviors that did not demonstrate improvement post-training, including active listening, convincing a youth to seek help, and actually taking a youth to a professional. There are several potential explanations for these results. Most gatekeepers reported "nearly always" engaging in such behaviors at baseline, thus a ceiling effect may have occurred. It is also possible that convincing a youth to seek help or physically taking the youth to a clinician was not in accordance with the policies and procedures in the gatekeeper's agency; for example, many agencies have gatekeepers inform parents who are then responsible for seeking the youth's assent and transporting the youth to a clinician who can do a full risk assessment. The fact that active listening did not improve is concerning and suggests a direction for future research as this is thought to be a vital part of connecting with someone in distress.

Previous studies (Chagnon et al., 2007; Isaac et al., 2009; Keller et al., 2009; Matthieu et al., 2008; Wyman et al., 2008) have demonstrated that gatekeeper training increases knowledge, promotes positive attitudes, and increases participants' confidence in their ability to intervene, but evidence of behavior change and referrals of youth to services have been lacking. Given the funds spent nationally on gatekeeper training via the Garrett Lee Smith Memorial Act, it is critical to demonstrate the effectiveness of this approach. It is important to note that ASIST is arguably the most time intensive (two full days) and clinically oriented of the evidence-based gatekeeper training programs; as such, it likely provides a higher dose of skills training and may be more likely to have participants who have self-referred due to interest in the program (as opposed to

those who attend briefer trainings mandated by their employing agencies).

Future research should explore (1) the relation between intensity/length of training and extent of behavior change in gatekeepers and (2) the potential impact of being self-referred versus obligated to participate in gatekeeper training. In addition, it is important to replicate our findings regarding selected gatekeeper behaviors that did and did not improve over time. More detailed measurement about active, empathic listening should be added as well as additional information about how gatekeepers support a referral to treatment. Should others demonstrate similar findings, this could suggest a need for improvements in subsequent editions of the ASIST training curriculum.

Our findings also replicate the idea that certain individuals have characteristics that may predispose them to use gatekeeper skills at a higher level. The natural helper variable first identified by Wyman and colleagues (2008) with a sample of all secondary school staff who received QPR (a 90 minute training) is also predictive of self-reported skill utilization in the current study with a different training curriculum, different participant recruitment strategy, and with gatekeepers from a range of youth-serving agencies. Gatekeepers who identified themselves as someone that youth naturally come to for assistance were more likely to report higher levels of case identification and helpful responses at follow-up. Interestingly, the natural helper variable was only related to overall scores at follow-up, but not to changes in behavior over time. Thus, our data suggest that gatekeepers who identified as natural helpers went on to be high utilizers of training skills, but were also likely to have been engaging in such behaviors already. Future research should examine whether natural helpers improve their gatekeeper behaviors in specific ways as a function of training (e.g., ability to connect more easily with youth; ability to explore ambivalence; ability to gain youth support for treatment referral) and whether this has an impact on youth outcomes, such as treatment linkage, mood, or risk for self-harm. Additionally, the utilization of control groups as well as more objective and multimethod research techniques could enhance future work. Specifically, utilizing data from the referred youth about which specific gatekeeper behaviors they experienced could further clarify the mechanisms through which gatekeeper behaviors may support positive youth outcomes.

Results indicate that high self-reported gatekeeper reluctance at baseline significantly predicted lower utilization of ASIST skills at follow-up, while positive attitudes about one's efficacy to prevent suicide at baseline predicted higher utilization of skills. Interestingly, these attitudes were stronger predictors of follow-up behaviors than the natural helper designation. While training curriculums are known to improve attitudes in participants, our results suggest that the attitudes held prior to training may also be critical in predicting behavior after training. Future studies with this data set will be able to more fully examine the specific types of attitude change that may occur as a function of ASIST and the relation of these changes to gatekeeper behaviors.

Findings that gatekeeper attitudes and/or natural helper status predict self-reported utilization behaviors have significant implications for communities and organizations engaging in suicide prevention. These findings may help to guide communities to spend their training dollars wisely by targeting extensive skill-based programs, such as ASIST, to individuals who are more likely to make consistent use of these skills. For example, communities and agencies might consider implementing prescreening measures and using the results to assign staff to different levels of training intervention. Staff who present with high levels of reluctance about suicide prevention may benefit from a less intensive training concentrated on information and attitude change, while staff who have an existing propensity toward natural helper behaviors may make the best use of intensive trainings like ASIST.

In conclusion, gatekeeper training programs are a promising component of a

public health approach to suicide prevention. Our study demonstrates small but significant positive changes in many gatekeeper behaviors, resulting in more identifications of, helpful responses to, and referrals for youth at risk for suicide.

REFERENCES

Centers for Disease Control and Prevention. (2013). Suicide prevention. Retrieved May 1, 2016, from http://www.cdc.gov/ViolencePrevention/suicide/index.html.

Centers for Disease Control and Prevention. (2014). *Web-based Injury Statistics Query and Reporting System (WISQARS)*. Retrieved May 1, 2016, from http://www.cdc.gov/injury/wisqars/index.html.

Chagnon, F., Houle, J., Marcoux, I., & Renaud, J. (2007). Control group study of an intervention training program for youth suicide prevention. *Suicide and Life-Threatening Behavior*, *37*, 135–144.

Cross, W., Matthieu, M. M., Lezine, D., & Knox, K. L. (2010). Does a brief suicide prevention gatekeeper training program enhance observed skills? *Crisis*, *31*(3), 149–159.

Gould, M. S., & Kramer, R. A. (2001). Youth suicide prevention. *Suicide and Life-Threatening Behavior*, *31*, 6–31.

Hayden, J. (2009). *Introduction to health behavior theory*. Sudbury, MA: Jones and Bartlett.

Hochbaum, G. M. (1958). *Public participation in medical screening programs: A sociopsychological study*. Washington DC: U.S. Government Printing Office.

Isaac, M., Elias, B., Katz, L. Y., Belik, S. L., Deanne, F. P., & Enns, M. W. et al. (2009). Gatekeeper training as a preventative intervention for suicide: A systematic review. *The Canadian Journal of Psychiatry*, *54*, 260–268.

Keller, D. P., Schut, L. P., Puddy, R. W., Williams, L., Stephens, R. L., McKeon, R., et al. (2009). Tennessee lives count: Statewide gatekeeper training for youth suicide prevention. *Professional Psychology: Research and Practice*, *40*, 126–133.

Mann, J. J., Apter, A., Bertolote, J., Beautrais, A., Currier, D., & Haas, A. et al. (2005). Suicide prevention strategies a systematic review. *The Journal of the American Medical Association*, *294*, 2064–2074.

Matthieu, M., Cross, W., Batres, A., Flora, C., & Knox, K. (2008). Evaluation of gatekeeper training for suicide prevention in veterans. *Archives of Suicide Research*, *12*, 148–154.

Quinnett, P. (1995). *QPR: Ask a question, save a life*. Spokane, WA: QPR Institute and Suicide Awareness/Voices of Education.

Ramsay, R. (2004). New developments in suicide intervention training. *Suicidologi*, *9*(3), 10–12.

Reis, C., & Cornell, D. (2008). An evaluation of suicide gatekeeper training for school counselors and teachers. *Professional School Counseling*, *11*, 386–394.

Rivet Amico, K. (2009). Percent total attrition: A poor metric for study rigor in hosted intervention designs. *American Journal of Public Health*, *99*, 1567–1575.

Rodgers, P. (2010). *Review of the applied suicide prevention intervention skills training program (ASIST)*. Living Works Education. Retrieved June 28, 2013, from http://www.livingworks.net/userfiles/file/ASIST_review2010.pdf.

Rodi, M. (2010). *Lessons learned from the cross-site evaluation*. U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration. Retrieved March 12, 2014, from http://www.sprc.org/sites/sprc.org/files/event_materials/Plenary%205%20Rodi.pdf.

Suicide Prevention Resource Center. (2014). *Evidence-based programs best practice registry*. Retrieved May 1, 2014, from http://www.sprc.org/bpr/section-i-evidence-based-programs.

Swank, J. R., & Buila, S. M. D. (2010). Gatekeeper training for caregivers and professionals: A variation on suicide prevention. *Advances in Mental Health*, *9*, 98–104.

Tanney, B., Ramsay, R., Lang, W., & Kinzel, T. (2006). Safetalk: Development of brief skills training in suicide intervention. *Psychiatria Danubina*, *18*, 94–95.

U.S. Census Bureau. (2010). *State &\ county quickfacts: State of Michigan*. Retrieved March 12, 2014, fromhttp://quickfacts.census.gov.

U.S. Department of Health and Human Services. (2006). *Cross-site evaluation of the Garrett Lee Smith youth suicide prevention and early intervention program: State/tribal implementation and procedures manual*. Retrieved June 26, 2013, from http://www.ct.gov/dmhas/lib/dmhas/prevention/cyspi/tribalmanual06.pdf.

Wu, P., Katic, B., Liu, X., Fan, B., & Fuller, C. (2010). Mental health service use among suicidal adolescents: Findings from a U.S. national community survey. *Psychiatric Services*, *61*, 17–24.

WYMAN, P. A., BROWN, C. H., INMAN, J., CROSS, W., SCHMEELK-CONE, K., GUO, J., & PENA, J. B. (2008). Randomized trial of gatekeeper program for suicide prevention: 1-year impact on secondary school staff. *Journal of Consulting and Clinical Psychology*, *76*, 104–115.

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